CLAIMS

1. A semiconductor device, using a bonding material for linking a semiconductor terminal to a connecting terminal for an outside circuit, characterized by reinforcing the bonding material and/or a joint bulb between the terminal and a connecting material with a reinforcing material.

2. A semiconductor device according to claim 1 characterized in that the bonding material is a bonding wire and/or a bump.

3. A semiconductor device, using a bonding wire for linking a semiconductor terminal to a connecting terminal for an outside circuit, characterized by reinforcing the bonding wire, either partially or wholly, with a reinforcing material after bonding work.

4. A semiconductor device according to any one of claims 1 to 3 characterized in that the bonding material and the reinforcing material consist of different materials.

5. A semiconductor device according to any one of claims 1 to 4 characterized in that the reinforcing material consists of a metal and/or an inorganic material and the reinforcement covers the wire or a joint bulb with any of the metal coating and the inorganic material coating.

6. A semiconductor device according to claim 5 characterized in that the metal coating consists of an alloy comprising one or more of nickel, copper, gold, tin, solder, silver, cobalt, chromium, platinum, palladium and tungsten.

7. A semiconductor device according to any one of claims 1 to 6 characterized by forming, at the interface between the metal coating and the metal surface of the bonding wire, a diffusion layer of the two metals.

8. A semiconductor device according to any one of claims 1 to 7 characterized in that the bonding wire consists of any one of gold, copper, aluminum, silver and

an alloy of any of these metals.

9. A semiconductor device according to any one of claims 1 to 8 characterized in that the concentration of gold at the outermost surface of a bonding wire consisting of gold or a gold alloy is 99% or less.

10. A semiconductor device according to claim 1 characterized in that the bonding material consists of any one of gold, tin, copper, aluminum and an alloy of any of these metals.

11. A semiconductor device according to any one of claims 1 to 10 characterized by coating the area covering the semiconductor, the bonding wires, the connecting terminals and the joint bulbs with resin.

12. A semiconductor device according to claim 11 characterized in that the resin is a semiconductor sealing resin containing ceramic filler.

13. A semiconductor device according to any one of claims 1 to 12 characterized by forming the connecting terminal using a substrate, a lead frame or a TAB tape.

14. A semiconductor device according to any one of claims 1 to 13 characterized by forming the semiconductor terminal on any one of a semiconductor chip, the substrate, the lead frame or the TAB tape.

15. A semiconductor device according to any one of claims 1 to 14 characterized in that the surface of the semiconductor terminal consists of copper, aluminum, nickel, cobalt, gold, silver and an alloy of any of these metals.

16. A method to produce a semiconductor device having a joint bulb between each of semiconductor terminals and connecting materials, characterized by including:

a process to bond the terminals with the bonding materials; and

another process to coat the connecting materials and/or the joint bulbs with a plating material for the purpose of reinforcement.

17. A semiconductor device, using a bonding wire for linking a semiconductor terminal to a connecting terminal for an outside circuit, characterized by: the diameter of the bonding wire being less than 20 μm; and reinforcing the bonding wire, either partially or wholly, with a reinforcing material after bonding work.

18. A method to produce a semiconductor device using a bonding wire for linking a semiconductor terminal to a connecting terminal for an outside circuit, characterized by including:

a process to link the semiconductor terminal with the connecting terminal using the bonding wire; and

a process to reinforce the bonding wire by coating it, either partially or wholly, with metal or inorganic material such as a ceramic.

19. A method to produce a semiconductor device using a bonding wire for linking a semiconductor terminal to a connecting terminal for an outside circuit, characterized by including:

a process to link the semiconductor terminal with the connecting terminal using the bonding wire;

a process to reinforce the bonding wire by coating it, either partially or wholly, with a metal or an inorganic material such as a ceramic; and

a process to coat or seal the area, covering the semiconductor, the bonding wires and the connecting terminals, with resin.

20. A method to produce a semiconductor device according to claims 18 or 19 characterized by coating the bonding wire, either partially or wholly, by electrolytic or electroless plating of metal in the process to reinforce the bonding wire.

21. A method to produce a semiconductor device using a bonding wire for linking a semiconductor terminal to a connecting terminal for an outside circuit,

according to any one of claims 16 to 20, characterized by including a process to subject the bonding wire to a heat treatment at a temperature of 50°C or higher after the process to reinforce the wire by the metal coating.

Abb17